

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of fabricating a steel part by forging, the method comprising the steps of:

- preparing and casting a steel having the following composition in percentages by weight: $0.06\% \leq C \leq 0.35\%$; $0.5\% \leq Mn \leq 2\%$; traces $\leq Si \leq 2\%$; traces $\leq Ni \leq 1.5\%$; traces $\leq Al \leq 0.1\%$; traces $\leq Cr \leq 1.5\%$; traces $\leq Mo \leq 0.30\%$; traces $\leq V \leq 0.5\%$; traces $\leq Cu \leq 1.5\%$; $5 \text{ ppm} \leq B \leq 50 \text{ ppm}$; $0.005\% \leq Ti \leq 0.04\%$ where $Ti \geq 3.5$ times the N content of the steel; $0.005\% \leq Nb \leq 0.06\%$; ~~$0.003\% \leq S \leq 0.2\%$~~ $traces \leq S \leq 0.2\%$; the remainder being iron and impurities that result from preparation;
- forging a blank for the part at a temperature in the range 1100° C to 1300° C ;
- cooling the blank for the part in a controlled manner in still or forced air at a speed less than or equal to 3° C/s in the range 600° C to 300° C , thereby imparting a bainite microstructure to the blank;
- machining the part; and
- deep rolling the part at locations that are to be subjected to particularly high levels of stress, wherein the deep rolling is performed with an applied load between 800 daN and 1200 daN, generating high residual compressive stresses.

2-5. (Cancelled)

6. (Original) A method according to claim 1, wherein the steel contains 0.005% to 0.2% of S.

7. (Original) A method according to claim 6, wherein the steel contains at least one of the following elements: Ca up to 0.007%; Te up to 0.03%; Se up to 0.05%; Bi up to 0.015%; and Pb up to 0.15%.

8. (Original) A method according to claim 1, wherein the C content of the steel lies in the range 0.06% to 0.20%.

9. (Original) A method according to claim 8, wherein the Mn content of the steel lies in the range 0.5% to 1.5%, and wherein the Cr content lies in the range 0.05% to 1.5%.

10. (Original) A method according to claim 8, wherein the Cu content of the steel lies in the range 0.5% to 1.5%.

11. (Previously presented) A method according to claim 1, wherein the C content of the steel lies in the range 0.25% to 0.35%, the Si content lies in the range traces to 0.5%, the Mn content lies in the range 0.8% to 2%, the Cr content lies in the range 0.5% to 1.5%, and the Mo content lies in the range 0.05% to 0.20%.

12. (Previously presented) A method according to claim 1, wherein the C content of the steel lies in the range 0.20% to 0.35%, the Si content lies in the range 0.5% to 2%, the Mn content lies in the range 0.8% to 2%, the Cr content lies in the range 0.5% to 1.5%, and the Mo content lies in the range 0.05% to 0.20%.

13. (Original) A method according to claim 12, wherein annealing is performed in the range 300° C to 500° C for a period of 1 h to 3 h after machining or after controlled cooling in air and prior to machining.

14. (Cancelled)

15. (Original) A steel forging, obtained by the method according to claim 1.

16. (Original) A steel forging according to claim 15, constituting a crank shaft for an IC engine.

17. (Original) A steel forging according to claim 16, wherein the mechanical reinforcing operation is performed on the fillets connecting the crank pins and the bearings of the crank shaft.

18. (Cancelled)